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THE
Eucalyptus
Hardwood Trees
OF
California

By
A. R. HEATH



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INDORSEMENTS

We, residing in California, are thoroughly familiar with the Eucalyptus tree, its growth, uses and value. We have read the original matter produced by Mr. Heath, on the subject of Eucalyptus, together with the authorities he quotes, concerning all of which we have intimate knowledge.

The ground he takes is approved by us, and we believe that his booklet is a fair, impartial and reasonable presentation of this important subject, and should be of service to those contemplating commercial planting of Eucalyptus.

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Professor of Horticulture, University California

David Starr Jordan

President "Leland Stanford" University

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Ex-State Forester of California

C. H. Sellers

Ex-Asst. State Forester of California

Elwood Cooper

Pioneer Eucalyptus Planter of California

Spencer Brintnall

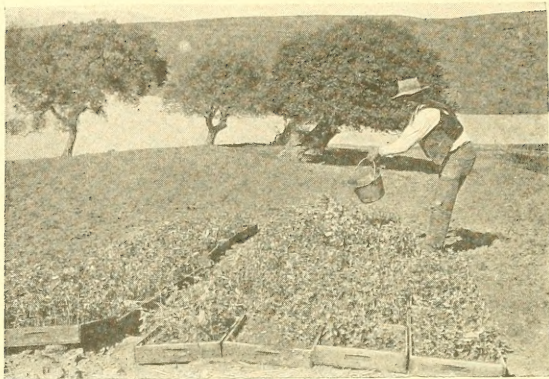
Eucalyptus Planter—Director and
Ex-Pres. Drovers, Nat'l Bank, Chicago

PREFACE

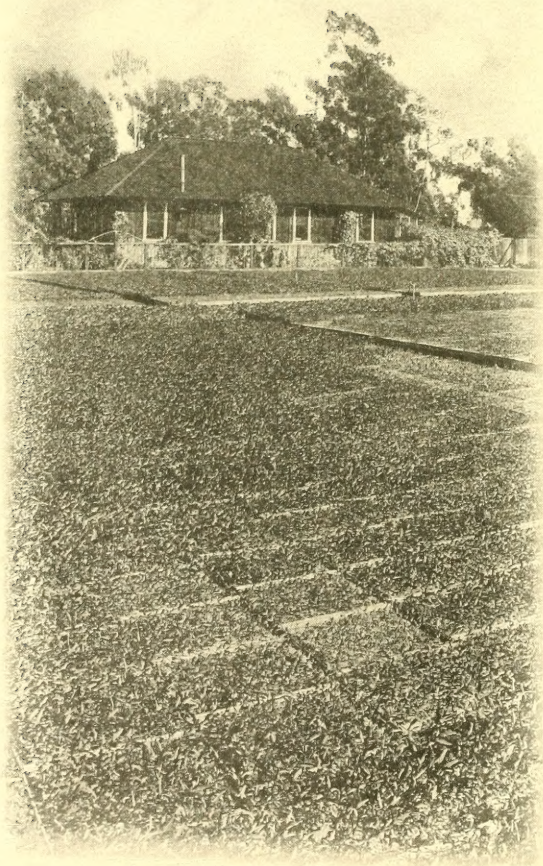
The public interest in the commercial planting of Eucalyptus hardwood trees in California is such as might be called clamorous in its demand for more information of a reliable character upon this subject, especially from an investment point of view.

To partially meet this demand with a reasonable view of the possibilities inhering in this subject, as based upon what has actually been accomplished, this pamphlet has been compiled. It is offered, not as a complete treatise on the subject, but more as a classified compilation of authentic data, combined with the opinions of well recognized authorities—all in condensed form—and with reference to the government's recent predictions of a coming timber famine and its results, together with the official reports concerning the growth, uses, value and profit of commercially produced Eucalyptus in California.

One further aim has been to set forth, as forcefully as possible, before the prospective planter or investor the importance of the scientific, intensive twentieth century methods of planting and growing Eucalyptus, and the attending benefits. The results of these methods as seen in recent measurements, are unprecedented, and open up a new era in the cultivation for profit of this remarkable tree.



Watering nursery stock ready for planting.



Seed nurseries.



"The first tree planted."

EUCALYPTUS HARDWOOD TREES OF CALIFORNIA

PART I—THE VALUE OF FORETHOUGHT.

Nature is ever generous, but in this remarkable tree she surpasses herself.

The commercial planting of Eucalyptus trees in California under correct conditions is a creative enterprise in which Nature produces an unfailing product of the soil (the source of all wealth) a product as staple as wheat, in which natural growth supplemented by scientific and intensive cultivation compounds earnings at such a ratio as to make possible a high return with safety on the capital invested.

Quotations.

Authorities quoted in support of Eucalyptus and its superior advantages as an investment, are complete and convincing. The statements are from men in a position to know, and having the highest standing. The figures are authentic, and arrived at after scientific and exhaustive study. The best way to learn about Eucalyptus is to study it for yourself.

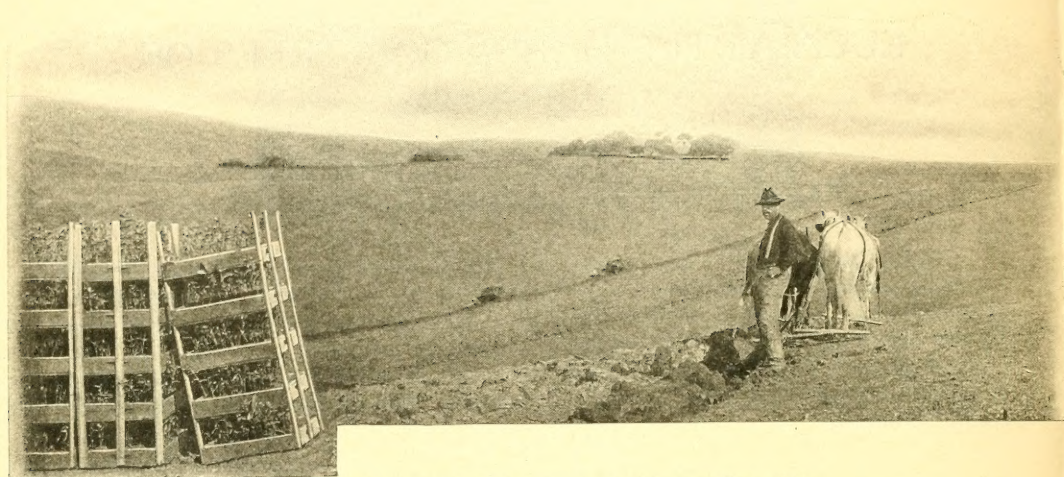
Eucalyptus (U-k-lip-tus) commonly known as "Australian Mahogany," has been grown in California for about sixty years, but the now known usefulness and value of these trees has until quite recently been underestimated. We have only just found that we need them, and are destined to need them indispensably. They have come to our aid at a time when we are facing a grave crisis.

Hardwood Famine.

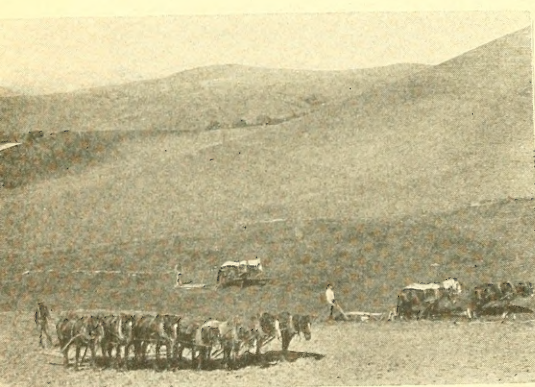
It is now well established that the supply of timber is very low. We cut 134 million board feet (approximately 30,000 acres) every day—three times the rate of production. With hardwoods alone, the situation is even more alarming, the cut being ten times the rate of production. Thirty-one million board feet of hardwood is cut daily, and no less an authority than the Forestry Bureau of the United States Government is responsible for the statement that we now have less than fifteen years' supply.

This is a most serious dilemma, as amongst all our industries the timber ranks fourth. Lumber manufacture employs approximately 1,000 millions of capital, with an annual product exceeding that amount. To cut off the raw material will be to deplete the pay envelopes of over 600,000 workingmen employed directly in industries dependent for their very existence on a continuous supply of hardwood.

"A general failure in crops may affect industrial conditions for a few years—a failure in the hardwood supply would be a blight upon our industries through more than a generation." U. S. Forest Service Circular No. 116 adds: "We have apparently about fifteen years' supply of hardwood lumber now ready to cut."



Preparing to plant 1,000 acres near Monterey Bay, Cal.



Deep plowing, preparatory to planting
a Eucalyptus forest.



Planting crew setting out baby trees.

What this industrial disaster would mean in the loss of trade by merchants, manufacturers and farmers, and the consequent shrinkage in bank deposits, and the unbalancing of trade and finance, is only too evident. A single year of hardwood famine will kill all our great wood-working industries and close their factory doors, with disastrous results to the whole country.

Pinchot, Roosevelt, the several Conservation Associations, National and State Forestry Departments, corporations and individuals—men of keen business foresight and political economists have “sounded the warning of the coming hardwood timber famine.” Mathematicians have made miles of figures to show how fast timber is disappearing. But no power can halt the headlong destruction, for in this practical age men do not stop for sentiment nor for advance in cost, but pay the price and continue their building. The situation is so alarming as to have called for state legislation. It’s a timely subject. It’s in the air, and we, the nation and individuals, are waking up when it is now too late. The utmost we can do will afford no relief in this generation. The *American Lumberman* (the leading journal of the timber trade) says:

“If reforestation were now to be undertaken in the most broad and efficient way, the result could not be felt in the lumber markets for fifty years.”

We must begin reforestation now, for posterity’s sake. But what can we do for our own sakes?

The fact confronts us that we face a severe shortage in ten years, and an absolute famine in fifteen years, when commercial raw material can not be had for love nor money, nor for fifty years to follow. How can we bridge this gap?

Hardwood Prices.

Meanwhile prices mount. One need go no further than the nearest lumber yard to realize how prices have advanced. They have risen over fifty per cent in the last ten years. With the return of normal business conditions, building and manufacturing operations will boom, and as the hardwood timber famine grips, prices must soar. In the *American Review of Reviews* for May, 1908, page 590, GUY ELLIOTT MITCHELL, of the U. S. Geological Survey, says as follows:

“The Nation’s Worst-Abused Resource.—Of all the country’s natural resources, the forests have been the most shamefully treated, with the result that we are nearer the exhaustion of this asset than in the case of any other natural resource. *At the present rate of timber consumption, the price of every class of lumber ten years hence will be about double the present figure.*”

The plain business fact is that the demand will soon be desperate. This view is not pessimism. It is merely a statement of the truth.

Wanted—A Remedy! An Escape!

Eucalyptus a Complete Hardwood.

The native sons of California who found it hard to cut and split the stubborn Eucalyptus for fuel, had a new revelation when these famine prospects were published by the Government. They got busy. They made tests. “Eucalyptus” was thoroughly tried out, underground, under water, in the manufacture of furniture, vehicles, veneers, agricultural implements and machinery, of insulator pins (holding the thread perfectly), of telegraph, trolley and telephone poles, piling, fence posts, railroad ties, and succeeded in all these uses, demanding toughness under pressure, strength under strain, resisting power under blows, and durability in weather, under ground, and in fresh and salt water.



First clearing and plowing



Planting: 3 months old, 2 to 3 feet high. Beans between rows to conserve moisture. Far hill planted but not in beans.

Eucalyptus has, moreover, a hard surface, a beautiful grain, and takes the finest piano polish, and in the interior finish of homes, office buildings, and palace cars, it has every quality of use or beauty of the *ideal hardwood*, and rivals the most costly. The authorities on all the above points are official, complete and impressive.

Rapidity of Growth.

The most notable quality of the Eucalyptus tree is its rapidity of growth. No other hardwood approaches it in this respect. It absolutely matures ready for use, under modern scientific intensive cultivation, *within ten years*. Authorities cite many plantations which measure up to this statement.

How wonderfully this fits our need in the impending crisis! Nature has kept her gracious boon hidden until now—at the very nick of time!

Why Business Men are Investing in Eucalyptus.

American shrewdness and “gumption” are quick to see and act. Numerous clear-headed persons and chiefs of corporations who *think ahead* have already set out about twenty-five million Eucalyptus trees in California within the last few years. This, however, is but a drop in the bucket, hardly one-fourth of what should have been and ought to be done *every year*. The cut of 125,000 acres, 100,000 board feet to the acre, would be required annually, in order to provide for the time of need. The certainty of very large profits at a comparatively early date has been the motive of this activity. The *American Lumberman* says:

“Timber investment, therefore, appeals to the intelligent citizen, whether he be a lumberman or not. The result has been that multitudes of individuals, bankers, merchants, men and women of all professions, and in all walks of life, having surplus capital, have been investing in timber.”

The same journal says, on page 30 of its issue of March 20, 1909:

“*Under proper conditions* a Eucalyptus plantation should begin to pay after five or six years, and within ten or twelve years should be yielding enormous profits, exceeding anything that can be secured from a citrus crop, any horticultural crop, or even truck gardening. The probabilities thus expressed seem like a dream, so tremendous are the figures of yield and almost certain profit.”

This latter quotation has been widely circulated. It illustrates an unfortunate tendency among writers, especially during the introductory stages of any newly-discovered process or product, or values, to go to extremes as to results. While it is true that perhaps seven years will produce some values in posts, piling and the like, there are no facts to support the claim that any large percentage of the ultimate yield is reached at that period.

On the other hand, the records as herein quoted, are strong and clear as to the large values of the ten years' product. Of course, the correct soil and modern cultivation are understood.

It is to be remembered, moreover, that even the *Lumberman's* optimistic views do not take into consideration the enormous rises in hardwood prices already begun in anticipation of the inevitable famine.

Standing timber is always a staple asset at any stage of growth, and naturally prices depend upon supply and demand. America's needs for hardwood grow with the country's growth. Hardwood is a prime necessity of life! It is a call of our civilization at a thousand points. The shortage intensifies the demand, and sends prices upward. Foresightedness means fortune! Shortsightedness means misfortune!



Trees 5 months old—Man shown is 5 feet 6 inches tall.



Planting: 16 months old, over 20 feet high.
Side hill in distance planted with
young trees.



Illustrating uniform stand of trees.

The Natural Appeal to Forethought.

The present supply of Eucalyptus is alarmingly small. There cannot be 10,000 acres now ready for cutting. The year's cut of all timber in 1907 was 40 billion board feet (U. S. Government Bulletin), while in 1910 it had grown to 55 billion board feet (*Moody's*, a leading statistical authority). If only one-fourth be credited to hardwood, then there should be provision every year, outside of the fuel demand, for about 14 billion board feet of hardwood, on the present basis of demand—and that demand is growing. A great number of hardwood factories will undoubtedly move to California, for the necessity is to follow the base of supply. The season of 1909-10 saw less than 23,000 acres set out to Eucalyptus—"the only hope of a hardwood supply." The best commercial varieties of this tree are very intolerant of drought, heat and frosts, and to succeed they require special conditions. California is the only state where they prosper, and here in but a limited area. Instead of 23,000 acres, we should set out 125,000 to 150,000 acres of Eucalyptus in California *every year!* Lumber is a subject which demands a "long look." Is it right to sleep, because we have a small supply ahead just now? With every energy and available acre employed, the market cannot be fully supplied. Business men as well as state and national authorities see here a most serious and pressing call. Constructive action is the imperative need—and is already being richly rewarded.

Conservation.

Added to the above considerations, the claims of conservation require attention. To plant trees means the prevention of floods and drouths, the preservation of soil fertility, the modification of climate, the betterment of health, a fine increase in population and great prosperity alike to growers and manufacturers. This is more than sentiment—it is intelligent self-interest.

Evidence is clear that he who plants Eucalyptus properly now, and cultivates well, can have mature trees *in ten years* to sell to an urgent and clamorous market, at top prices.

The valuable by-products of Eucalyptus, as slabs, posts, fuel, oil, food for honey bees, etc., serve in many cases to meet all expense of opération.

Most Important Factors.

Little was expected of Eucalyptus under former conditions. It was distinctly subordinate, grown merely for shade, fuel, or as windbreaks, and if it served these humble uses in fifteen, twenty or thirty years, no more was expected. Naturally, this called for little or no cultivation. Cheap uses implied cheap treatment.

But now, with an impending timber famine, and with the superiority of Eucalyptus proven, all is different. Eucalyptus has become king, and his business requires haste. The present-day method of scientific intensive cultivation, producing, as it does, over three times the result, is truly impressive.

To be Borne in Mind.

Here is a point to be remembered about statistics. Records of trees already mature are in almost every instance *the statistics of neglect and of tree-starvation*. This is necessarily true, because at the time these trees were set out (the critical



15 feet in 9 months—a State record at Chittenden, Cal.

time of youth when cultivation would have given the most benefit) no one knew of the hardwood famine, or that Eucalyptus would be proven a perfect substitute for oak, ash, hickory and mahogany, and for practically all commercial hardwoods. As already stated, no pains were taken in planting and care. These old trees simply struggled along, and had to take their chances. That they matured at all is proof of the tremendous vitality of the tree.

No reasonable man will accept these "statistics of neglect" as a standard of the growing possibilities of an Eucalyptus tree. Right here is the pessimist's fatal error, and the average lumberman's error as well. It is a case of using false measures—of comparing things not alike, which any professor of logic will declare a crime against reason. It is natural, but still an error.

For it is the broad distinction between the two systems of treatment—the old and the new—which is the most vital factor in the Eucalyptus-growing situation today. He who overlooks it, misleads himself.

The New System.

The New System is an economic necessity. The growers and manufacturers want more of these precious trees—and want them *quickly*. Every energy comes in play right here. In the first place, the best land is none too good, with good moisture conditions and sub-irrigation. A close examination of the soil, to avoid hostile chemical elements, is required. No more planting on waste land, or on hill-crests of shallow soil, with water draining away. Sheltered valleys and friendly fogs are sought.

So much for *location*.

Then, in the planting season, careful preparation is made to receive the seedling. The plow, the disk, the harrow, the roller are all to do their needful work, and shovels further pulverize the ground where the trees are to be planted. The soil is upturned from depth, cut, harrowed, cross-harrowed and rolled, until made the finest possible. Every obstacle to the quick growth of the rootlets is removed.

Here, *preparation* is seen at its best.

Next come men with skilful hands to transplant the seedlings to their new home. Every shock is avoided. The roots are still kept surrounded by their original soil and saved from exposure. The right distance for forest growth is observed. Then the seedlings are tucked up in their beds, and Nature nurses them.

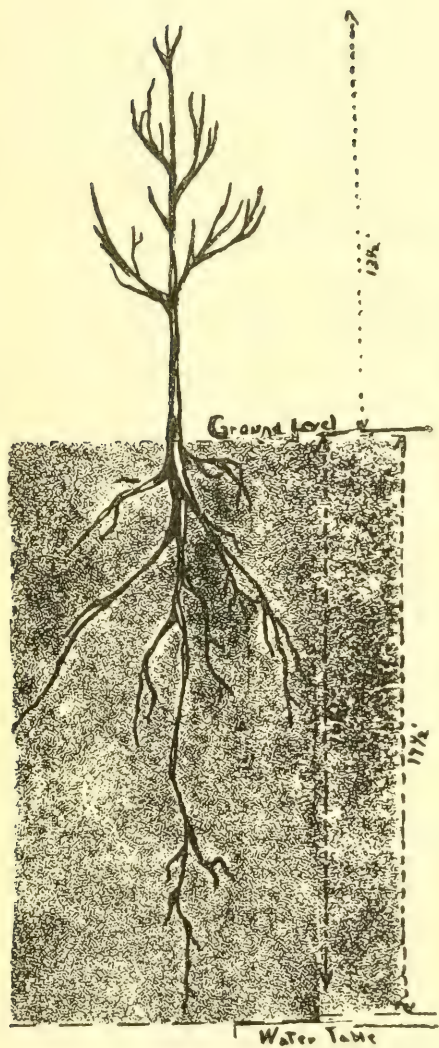
So much for *transplanting*.

Then comes the watch-care. A weed is like a lamp wick, the sun being the flame. Millions of weeds are millions of wicks, sucking moisture and robbing the tender seedlings of their chief need. If the thieving weeds are rooted up, over and over, the ground is kept mellow and rich and the moisture is conserved by capillary attraction. This is *intensive cultivation*.

It makes all the difference in the world—a great and profitable difference. Care pays better than neglect. The trees grow faster, simply because they must. Ten-year trees under such stimulus are many-fold more mature than older trees under neglect.

Cultivation versus Old-Style Figures.

Practically all the figures at our command are records under the "system of neglect." Nobody at that time realized the tree-value, as now understood. In fact, it is only within the last three or four years that the superior quality and beauty and marketing points of the timber have been proven and appreciated.



Accurate drawing of Eucalyptus 15½ months of age; 13½ feet in height; 13¾ inches in circumference at base; tap root 16½ feet below surface.

Scientific Intensive Treatment Stimulates Strong Root Growth.



E. Globulus at Chittenden, 16 months old.



"Coppicing" or second growth—peculiar to Eucalyptus.

Yet, even under old conditions, the figures show, in favorable locations, a good maturity in ten years. Had these same trees been scientifically cultivated, it must be conceded that the showing would have been much greater. Hence the old figures, (which are necessarily the only existing statistics of today,) are to be taken *subject to expansion*, in order to give due credit to the new methods.

It may be asked:—"Can you give examples of mature growth in, say, ten years, even though the grower did not know the tree's value at the time of planting?" Fortunately, it is not only possible to do this, but also to show a vivid contrast under conditions that are entirely fair. Mr. C. H. Sellers, of Sacramento, California, an expert who has been commended by the former State Forester as a well equipped forester of eight years' experience in direct contact with the growing Eucalyptus trees, while in the state and national Forest Service, cites a number of cases of this kind, and also emphasizes the great need of cultivation.

The Bailey Groves at Santa Ana, California.

Grove No. 1 has been left to shift for itself, with no cultivation whatever. At nine years of age, only 32 of its 666 trees reach 12 inches in diameter. The whole acre shows but 39,040 feet board measure. These are the statistics of *neglect*.

Grove No. 2, 1,000 feet away, eight years old, 474 trees, has been cultivated five years, and shows no less than 270 trees exceeding 12 inches in diameter, as against 32 in No. 1, a year older. As a financial comparison; No. 1, with 39,040 feet, at \$25 per M., the accepted stumpage value, shows \$975 at nine years; while No. 2, with 87,960 feet, shows value of \$2,199 at eight years.

These measurements were taken over a year ago, and if measured when ten years old, Grove No. 2 will undoubtedly show largely in excess of 100,000 board feet and \$2,500 value for the acre.

Cultivation makes the difference!

These were fair average sample acres, as stated by Mr. Sellers on page 60 of his recent publication. Many other cases could be quoted along the same general lines, affording similar lessons.

The Lumberman's Point of View.

Lumbermen outside of California, are unaccustomed to think of hardwood stumpage running over 5,000 to 15,000 board feet per acre, as most native hardwoods grow largely in scattered clumps of more or less irregular and crooked trees. The contrast, therefore, with the same number of planted, cultivated acres, with trees in regular rows, of more uniform size, 8 or 10 feet apart, and with all the growing power of the tree concentrated in one straight bole (because of forest conditions), is very great. Under these conditions the production of 100,000 board feet per acre of the quick-growing Eucalyptus in ten years would be more natural than to reckon 5,000 or more feet stumpage of native hardwood of spontaneous and crooked growth.

The economy of lumbering such a condensed large body of 100 feet tall, straight timber with little waste, would more naturally command \$25 stumpage and be actually cheaper at that figure than might be \$5 or \$10 stumpage for scattered, deformed growth of great waste, requiring lopping and piling (to

VIEWS OF YOUNG HEALTHY GROVES ON ONE OF THE MOST PROMINENT
ESTATES IN CALIFORNIA



conform to federal forestry laws) and the superfluous handling required of trees which seldom produce clear logs of over 10, 12, or 14 feet. Bear in mind that the \$25 stumpage value does not take into consideration the enhanced value ten years hence.

The Standard of Measurement.

A further point is suggested by Mr. Sellers. In a recent letter to the writer he states:

"The Doyle and Scribner Rules of measurement only apply to the southern pines or similar sized logs; but the Eucalyptus is entirely different from any other tree grown, as it is a well known fact that the Eucalyptus forms long, clear boles anywhere from 40 to 60 feet on trees having a height of perhaps 90 feet. . . . I have known trees to measure 15 inches in diameter at $4\frac{1}{2}$ feet from the ground and have 12 to 13-inch diameter 50 or 60 feet from the ground. This shows conclusively that the tree tapers very slowly, while all the other trees that the Scribner and Doyle rule applies to usually cut one to three logs and taper very rapidly after the second log is cut."

In this attitude Mr Sellers would seem to be sustained not only by his own experience and observations, but also by the authority of Forest Service Bulletin No. 35, where at page 26 we are told:

"In the majority of species the trunk diminishes in size upward very gradually, being long and cylindrical. It is this characteristic that makes many of them so admirably adapted for masts, piles, bridge timbers and telegraph poles."

The government joins with Mr. Sellers, also, in calling attention to the inaccuracies of both the Doyle scale and the Scribner scale, as seen in the following quotations from U. S. Forest Service Bulletin, No. 36, "Woodman's Handbook," page 20:

"In sound logs the saw cut has been known to overrun the Scribner scale from 10 to 20 per cent."

This is said concerning logs of timber in general.

"In general the mill cut overruns the Doyle Rule log scale by about 25 per cent for short logs 12 to 20 inches in diameter; and for long logs with a small top diameter the overrun is very much higher."

Here, again, the reference is to timber in general.

The objections to the present statistics, as thus indicated, by the government and by this experienced forester, are:

1:—They are statistics of neglect, and do not cover the modern methods of cultivation.

2:—The measurements are applicable to an entirely different class of trees, and underestimate the tall, straight Eucalyptus trees of remarkably uniform diameter.

3:—Even as applied to general timber they are confessedly inadequate.

Security and Profit.

With no known enemy nor disease, with no possibility of over-production, with the feasibility of every protection from loss by fire in these cultivated groves, of evergreen trees, and with every assurance of unprecedented high prices of hardwoods in a few years, who can doubt the security and profit of the business? The worst that investors have to figure upon is the element of time. The longer held the greater the profit.

Two years and nine months growth
near
Watsonville, Cal.
E. Globulus.



Groves on lines of railroads afford easy access to mills, with commensurate profits.

Equal Benefits for Large and Small Investors Alike.

The larger Eucalyptus planting investments are being made by men of large affairs, as prominent officials of Railroads and other corporations, who are compelled to look ahead, by Bankers, Capitalists and Business Men of judgment and foresight, and by towns, municipalities, etc., etc.

Smaller investors, among whom might be classed the professional men, merchants and their clerks, farmers, superintendents, foremen and mechanics, etc., etc., are fortunately able to participate in these large and certain profits by joining well managed corporations who are planting *large* acreages for themselves and their associates under co-operative plans.

How Large Operations Help All Investors.

These larger acreage operations are more feasible and profitable, commanding, as they do, the brains and experience of the lumber world, with added profits through logging and milling operations (not warranted in tracts under 1,000 acres), and many other salient features which with limited acreage and capital would not be warranted. All these great benefits assure maximum profit at a minimum cost.

Californians Investing in Eucalyptus.

Perhaps nowhere else in the world has there been so high an order of intelligence, or so much time and money utilized in bringing products to perfection, as in California.

It should be remembered that California is a country of small farms, where five or ten acres under intensive cultivation often provide a competency.

That thousands of Californians in all walks of life, accustomed to these high returns, are planting Eucalyptus, even in many cases uprooting orange groves and other orchards (which have possibly seen their best days) and planting same with this remarkable tree, should be sufficient evidence to substantiate the claims made for Eucalyptus. The more timid investor may wish to inquire through the many California authorities on this subject, and of bankers, business and professional men, or almost any person of standing throughout the central and southern portion of the state where the many virtues of the Eucalyptus tree are so well appreciated as to be a matter of common knowledge.

Great credit is due to Mr. C. H. Sellers, (formerly in the Forest Service), land and timber expert, Sacramento, California, for his researches in the field for the past eight years in direct contact with Eucalyptus trees. His books have already thrown valuable light on the subject, and his new writings will be welcomed as the product of the well-stored mind of a recognized Eucalyptus expert fully endorsed by the highest authorities.



Grove of young Eucalyptus under superior cultivation.



The same grove one year later to the day.

AUTHORITIES

PART II—AUTHORITIES.

(In giving quotations brevity is served as follows: All United States Forest Service Bulletins, Circulars, etc., will be referred to by number and page, as "U. S. 59; p. 3," or "U. S. 116; p. 15," etc.

All quotations from the California State Board of Forestry will be referred to as follows: "Cal. Bd. 2; p. 33," etc. Names of newspapers will also be abbreviated, where possible. Other authorities will be indicated more fully.)

Eucalyptus is brought into great prominence of late by reason of certain conditions in the timber world, and in the financial world, as will be gathered from the following quotations from authorities: (Apart from the necessary headings, it is the aim to let the quotations tell their story without comment, save where a word of explanation may be deemed necessary).

The Forest a Perpetual Resource.

"Forestry is both misunderstood and underrated in this country. When these misconceptions are dispelled, the American people will handle the subject with true American spirit. The main point, which is not generally understood—in fact, the *pivot* on which the whole system rotates—is that we fail to rate the forest as a *living, perpetual resource*. Coal, copper, and other resources become *exhausted*, but the forest, if properly treated, will yield an *income forever*. It will supply labor and feed other industries for all time, if the rules of silviculture are rigidly practiced. In agriculture, fertilizers must be used to replace what the plant removes; in forestry, the soil actually *improves* and yields *ever-increasing returns* until the maximum is reached, when under good management it remains the same for *all time, ever* yielding a crop of useful material."—*Practical Forestry*, by JOHN GIFFORD, assistant Professor of Forestry, Cornell University.

The Impending Hardwood Timber Famine.

Seriously Depleted; Situation Grave—Roosevelt:—"As all of you know, the forest resources of our country are already being seriously depleted. . . . The United States is exhausting its forest supplies far more rapidly than they are being produced. The situation is grave, and there is only one remedy."—U. S. 25; p. 6.

Dangerously Near—Pinchot:—"This much is true beyond doubt, that we are dangerously near a hardwood famine and have made no provision against it."

Results of the Hardwood Famine.

Will Strike at the Very Foundation:—"There is sure to be a gap between the supply which exists and the supply which will have to be provided. . . . The present indications are that in spite of the best we can do, there will be a shortage of hardwoods running through at least fifteen years. How acute that shortage may become and how serious a check it will put upon the industries concerned cannot now be foretold. That it will strike at the very foundation of some of the country's most important industries is unquestionable."—U. S. 116; p. 14.

Eucalyptus
planter's home



Eucalyptus on sidehill.

Substitutes:—(Softwood, metal, concrete.) "Yet, prominent as these materials have become, they seem not to have reduced the demand for hardwood which besides being for the greater number of its original uses, has also found new ones."—U. S. 116; p. 16.

"House Document" 128, p. 384, contains a statement by FRANK H. LAMB, Washington State Forest Commission:

"The various substitutes for lumber have not decreased the per capita consumption, which shows a constant gain, from 342 feet b. m. in 1870 to 499 feet in 1906."

Total Lumber and its Products Manufactured in 1905

Number of Establishments.....	32,726
Total Capital.....	\$1,013,827,138
Wage Earners, (Greatest number).....	1,047,442
Wage Earners (Average number).....	735,945
Cost of Materials.....	\$518,908,150
Value of Products.....	\$1,223,730,336

—Census of Manufactures 1905, p. 32.

Hardwood Prices Strongly Advanced.

	1887	1898	1907
White Oak.....	\$52.00	\$55.00	\$80.00
Hickory.....	38.00	45.00	65.00
Hard Maple.....	20.00	20.00	32.50

—U. S. 116; p. 9.

Timber of Fixed Quantity.

Every Acre Inspected:—"Practically every acre of standing timber in the United States outside of government holdings has been inspected by the cruiser. The amount of available timber is a fixed quantity, and the end of it, under present conditions, is not far away."—*American Lumberman*.

Approximate Average Growth of Trees.

Species	Locality	Age, 50 years.		Age, 100 years		Age, 200 years	
Diameter 4.5 feet from ground		Diam. In.	Height Ft.	Diam. In.	Height Ft.	Diam. In.	Height Ft.
Birch, Yellow.....	New York....	4.5	35	9.4	59	19.4	75
Beech.....	Michigan....	3.8	35	10.2	73	16.6	75
Maple Sugar.....	Michigan....	3.8	35	9.	64	....	..
Hickory.....	Mississippi ..	..	..	13.3	..	26.	..
Oak, white	Tennessee....	8.7	57	11.2	65	22.	92
Ash, white	Arkansas....	12.1	90	20.3	106	....	..
Pine, long leaf	So. Carolina..	6.7	52	15.5	86	23.6	100
Pine, loblolly.....	So. Carolina..	15.9	86	24.5	111	....	...
Fir, Douglas.....	Washington...13.7	80	24.3	138	37.4	208	

—U. S. 36; Tables 58, 59, 60, 61

Rapid Growth of Eucalyptus.

Fastest Growing:—"The Blue Gum (*Eucalyptus globulus*) is, without doubt, the fastest growing tree in the world."—U. S. 35; p. 61.

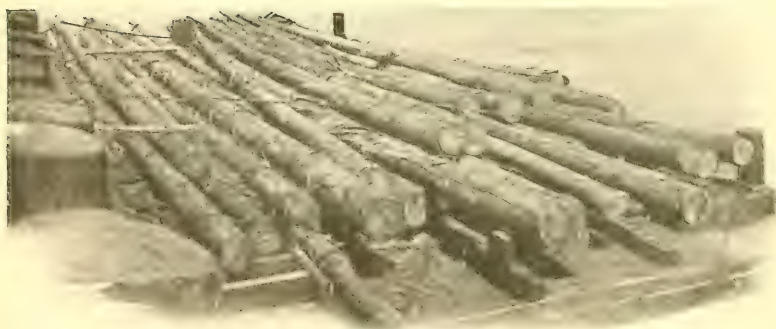
Six Inches a Day:—"In the height of the first growing season, seedlings (Blue Gum) have frequently been observed to make an average height growth of six inches a day."—Cal. Bd. 2; p. 33.



12-year old E. Globulus trees near San Jose, Cal., showing regular rows and large growth.



10-year old Eucalyptus Globulus trees, 100 feet high, near Monterey Bay, Cal.



Eucalyptus piles on barge for ferry slip, San Francisco.

Over 16 Feet a Year:—"Under favorable conditions, seedling plantations have reached a maximum development of five inches in diameter and sixty-seven feet in height in four years."—Cal. Bd. 2; p. 33.

A Foot in Diameter Every Five Years:—"The Blue Gum is one of the largest and most rapid growing trees in the world. In California under favorable conditions trees have attained a height of 175 feet, and a diameter of five feet in twenty-five years."—U. S. 59; p. 2.

Averaging 100 Feet in 10 Years:—"Seedling (Blue Gum) stands will average a height growth of fifty feet in six years and 100 feet in ten years. Under favorable conditions, individual trees have reached a height of 125 feet, and a diameter of thirty-six inches in nine years."—U. S. 59; p. 3.

Practical Testimony:—"On the ranch of HON. ELLWOOD COOPER, near Santa Barbara, California, trees of this species (Blue Gum) twenty-five years old are as large as oaks whose rings show them to be 200 to 300 years old. It is this rapidity of growth, enabling them to reach the stature of trees in a few years, that has been the principal cause of the popularity of the eucalyptus where they have been introduced."—U. S. 35; p. 36.

Distinctive Points of Eucalyptus.

Different Species of Eucalyptus:—There are six or eight recognized commercial varieties, of which the most widely used are the Globulus, or Blue Gum; the Rostrata, or Red Gum; the Tereticornis, or Gray Gum; the Corynocalyx, or Sugar Gum; the Resinifera, or Red Mahogany; the Viminalis, or Manna Gum, and others. These are usually written "E. globulus," "E. rostrata," etc. Each has its special uses and best habitat. The E. globulus has been planted most extensively. Experts have determined which species is best adapted for a given locality.

Detailed information will be given to enquirers so far as possible by the author of this booklet, upon request.

Hard, Tough and Durable:—"The matured wood of all species is hard—of some species very hard. Of many species it is tough and durable, resembling in this respect the wood of American oaks and hickories."—U. S. 35; p. 26.

Freedom from Insects and Diseases:—"Their dissemination throughout the world having been by seeds alone, the insect enemies and parasitic fungi of their native home have been left behind. In America they have few insect enemies and they are remarkably free from disease."—U. S. 35; p. 36.

As Strong as Second Growth Hickory:—"A comparison with Forest Service tests on hickory shows that 30-year-old E. globulus is stronger than XXX hickory, and that 15-year-old E. globulus is nearly as strong as second-growth hickory."—U. S. 8.

Seasoning:—"It is no more difficult to season than oak, hard maple and many other hardwoods which are annually cut and seasoned by the million feet."—Cal. Bd. 2.

Pinchot on Seasoning:—"It is believed, however, that in the seasoning of gum no greater difficulties will be encountered than in the seasoning of any other hardwood of similar density and strength."—U. S. 59; p. 5.

(Particulars about seasoning will be found in the statements of manufacturers herein).

Overproduction of Eucalyptus Is Impossible.

Only a Beginning:—"California can plant ten thousand acres each year for one hundred years, and then it would be only a beginning toward supplying the increasing demand for hardwood timber. . . . It is at once apparent that the need for development of this remarkable industry is great."—*San Francisco Examiner*, Nov. 13, 1909.

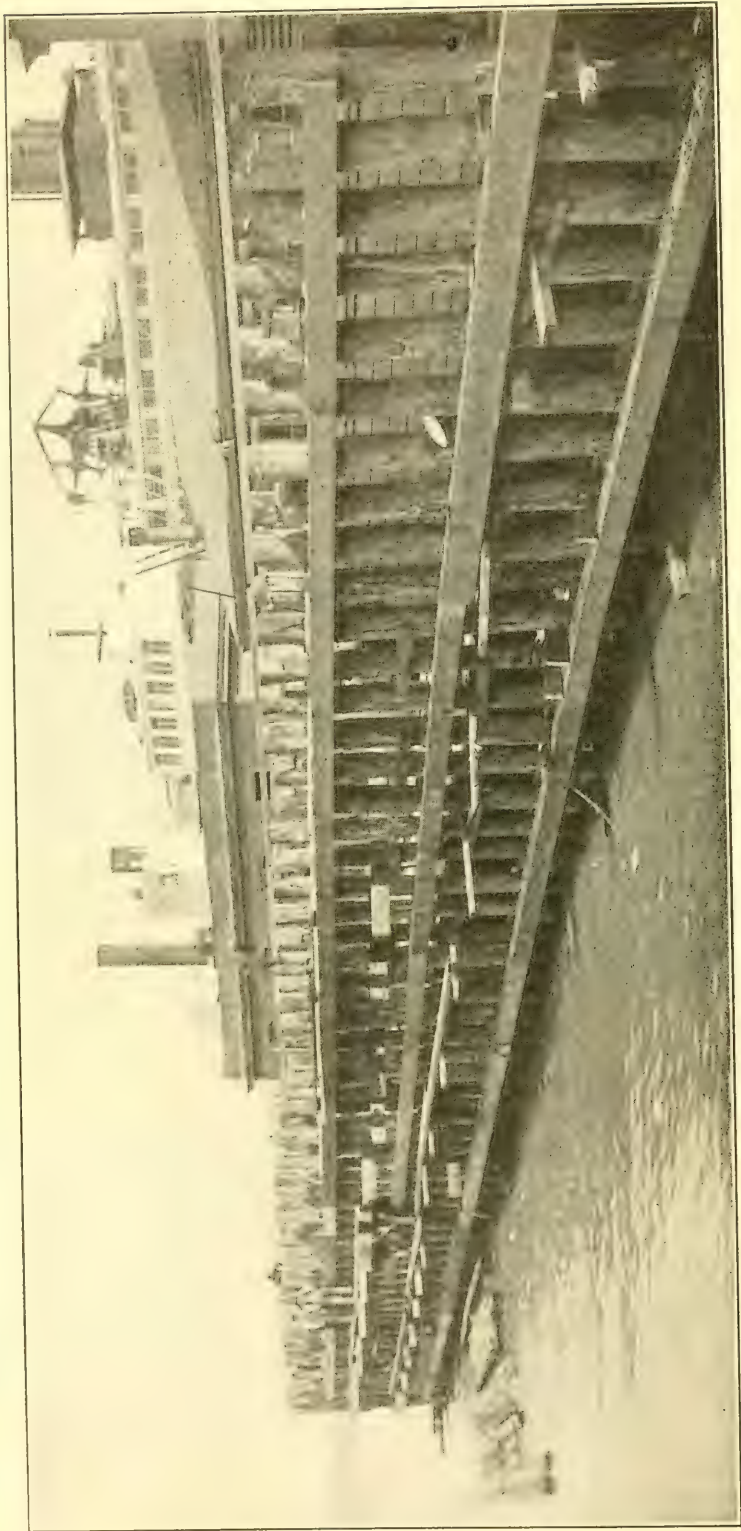
As an Acorn to the Oak:—"Millions of trees are being propagated, many millions will be planted each season, but as yet all these efforts are but an acorn to an oak as compared to ultimate necessity."—*Sunset Magazine*, closing a long article.

Practical Uses of Eucalyptus.

Comprehensive:—"It enters into the construction of buildings, ships, bridges, railroads, piers, telegraph lines, fences, paving, agricultural implements, barrels and a great variety of minor articles."—U. S. 35; p. 36.

Serves Many Uses:—"To these varieties is due, largely, the great variety of uses that the timber of these trees serves."—U. S. 35; p. 36.

2,000 EUCALYPTUS PILES HAVE BEEN DRIVEN DURING THE LAST YEAR IN SAN FRANCISCO WHARVES AND SLIPS.
(See conditions of piling taken from this pier, as illustrated, page 26.)



VIEW OF EUCALYPTUS (BLUE GUM) PILING AT SAN FRANCISCO FERRY SLIP.

These trees came from the famous Suto Eucalyptus Grove near San Francisco. The piling varies from 60 to 115 feet in length and the cost to the Harbor Commissioners was 20 to 30 cents per lineal foot. The largest ones amounted to \$14.00 each; the 60 footers to \$12 each. At these figures it is the best and cheapest piling on the market, as they last 20 to 40 years.

Over 5,000,000 piling and poles (Telegraph, Light, Trolley, etc.) are used yearly in the United States alone. The demand exceeds the supply to such an extent as to compel the use of softer woods which have to be treated at great expense.

Yield and Value of Eucalyptus.

The latest revision of Bulletin 5 of the Forestry Society of California says: *\$25 per M Stumpage is Fair*:—"The product of one acre containing 500 trees of the rapid growing species averaging 12 inches in diameter and having the usual proportions of 14 inch, 16 inch and larger trees will not vary much from an average of 100,000 feet, board measure, of merchantable lumber.

"The stumpage price now being paid for standing timber varies in accordance with location and shipping facilities. Lumbermen concede that \$25 per thousand feet is fair unless the timber be a long distance from the mills or inferior in size or shape. . . . Hardwood prices are constantly advancing and will undoubtedly be much higher in a few years, but at the present time \$25 per thousand is a safe, fair average. The grower who by proper planting and care produces 100,000 feet of timber on an acre in ten years' time can safely expect a net return of \$2,500. This is not unreasonable and may be accepted as the standard of stumpage value per acre of first class eucalyptus of marketable size."

The Same Price as Oak Lumber:—"The Eucalyptus lumber is being used in every place where great strength is required, and the finished product is valued at the same price as oak lumber."—University of California, Coll. of Agr., Berkeley Bull. 196.

High Rates for Oak Stumpage—The following information is condensed from a recent extended letter from CLARK L. POOLE & Co., Bankers, Chicago:

Kentucky is now the leading state in the production of oak lumber, where white oak stumpage values of \$9.62 exist in the western part of the state, * * * \$16.30 in Indiana, * * * while nearness to ready markets caused the maximum price of \$30 per M in New York.

Eucalyptus Profits Merely as Fuel; Returns from Six Acres Near Los Angeles in 6½ Years Show \$1,437 per Acre, or \$221 per Acre per Annum:—MR. L. MICHEAUX, of Compton, is one of the oldest growers of Eucalyptus in California. He says:—"I have kept careful records of the proceeds of my various cuttings as a guide to future care and sale. Last year I cut six acres of cord wood (sprout growth) at six and one-half years of age, and sold the same for \$3,726 net. I left 500 choice trees for telegraph poles standing, and sold them to the Los Angeles and Redondo Ry. Co. for \$2,800 cash; they to do the cutting and hauling. This averaged me \$5.60 per pole on the stump. In addition to the foregoing, I cut about 300 cords from this six acres when thinning my trees, realizing \$7 per cord net."—*Western Empire*.

Points About Profits.

Better Than Orchards:—"The returns on investments in eucalyptus plantations have been generous, in many cases exceeding those received from equal areas under cultivation in orchards or agricultural crops."—Cal. Bd. 2; p. 37.

Profits to be Derived:—"The profits to be derived from eucalyptus in the future will be found in hardwood lumber for wagon work, farm and other implements, railroad coach and house finishings, furniture, etc.; ties, telephone poles, and bridge timber will also prove profitable."—U. S. 196; p. 31.

Reaping the Reward:—"HON. ELLWOOD COOPER, of Santa Barbara, was one of the first Americans to recognize the prospective value of eucalyptus as forest trees. He acted upon his conviction, and has for a score of years been reaping the reward."—U. S. 35; p. 31.

California and Chicago Market Prices.

1909 *Prices of Telegraph Poles*:—Eucalyptus Poles, six inches across the top:—

35 feet long,.....	\$6.00 each	50 feet long,.....	\$ 9.25 each
40 " "	7.00 "	55 " "	11.75 "
45 " "	8.00 "	60 " "	12.50 "

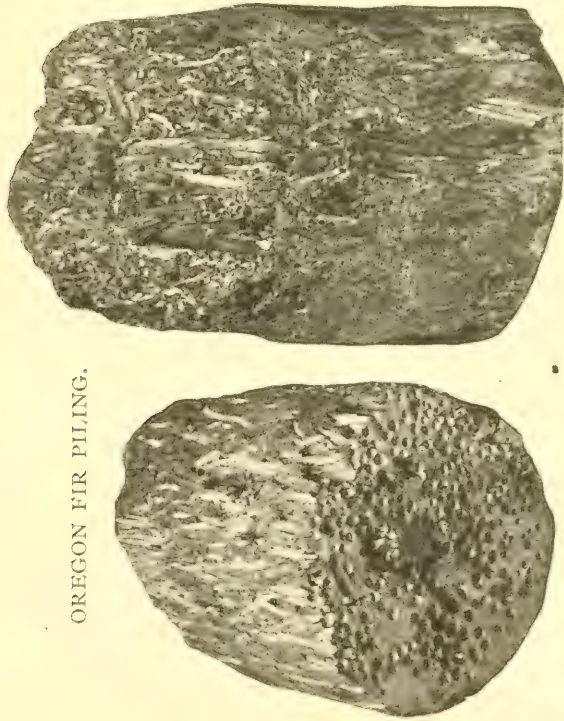
PEOPLE'S ELECTRIC Co., of Los Angeles.

1911 *Prices of Poles, Chicago Market*: Idaho Cedar Poles, prices furnished Nov., 1911, by GEORGE P. BENTON & Co., Chicago:—Yards, Hope, Idaho, and Newport, Wash., delivered f. o. b. cars, Chicago, Ill:—

8-inch, 50's, \$13 each; 8-inch, 60's, \$17; 8-inch, 70's, \$21.50 each.

(It is understood that Chicago is the cheapest large market for poles on the continent. Eastern and European markets are higher, being more distant.)

OREGON FIR PILING.



The accompanying specimen is a cross section cut from an Oregon Fir Piling which was drawn from one of our San Francisco slips after having been in the water for about three years.

It will be observed that same is entirely honeycombed; the result of the toredo.

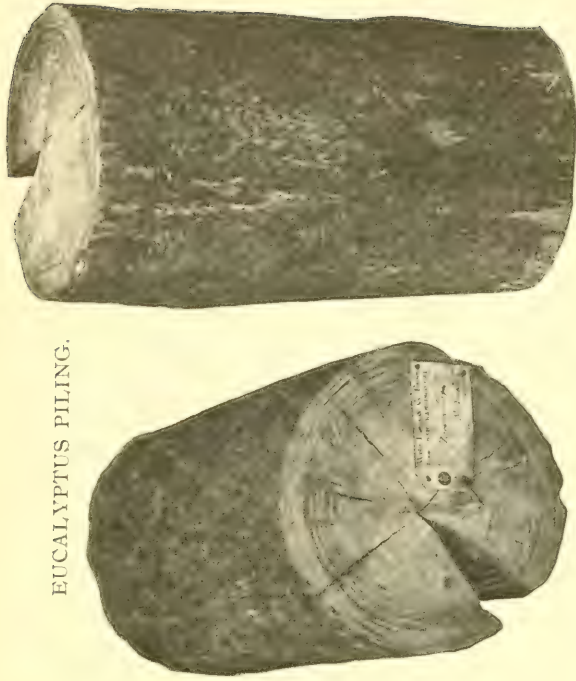
The average duration of this class and other piling commonly used in salt water, is about two years, and in many instances they are completely destroyed by the toredo in nine months.

Yours very respectfully,

G. A. JENKS,

Supt. of Repairs,
State Board Harbor Commissioners,
San Francisco, Cal.

EUCALYPTUS PILING.



The accompanying specimen is a cross section of blue gum (Eucalyptus Globulus) piling which, when drawn from one of our San Francisco wharves, had been in the water for ten or eleven years.

It was taken out to determine the lasting qualities of this class of timber in salt water and it will be observed that same is untouched by the toredo.

It was perfectly solid when removed and thoroughly water-soaked, hence the checking while drying.

We have driven over 2,000 new blue gum piles in our various wharves and slips during the last year, obtaining same from the Suto forest situated on the outskirts of this city.

(Signed) G. A. JENKS,

Supt. of Repairs,
State Board Harbor Commissioners,
San Francisco, Cal.

The effect of the opening of the Panama Canal upon prices will be marked. The Panama Commission have made known that freight from California to the Atlantic seaboard, now costing \$20 by rail, will for the same class, be about \$6 per ton via the Canal.

Continuous Income Assured.

The Repeated Sprout Growths:—"When cut down, Eucalyptus sends up shoots that will reach a height of 75 to 100 feet in six to eight years. The cutting may be repeated every few years for an indefinite period."—U. S. 35; p. 25.

Eucalyptus Oil.

Valuable Product:—"The manufacture of Oil may well be considered as a source of revenue upon the exploitation of extensive Eucalyptus plantations. It is obtained by a process of distillation, in which the leaves and small brush are utilized. There are a number of manufacturers located at different parts of the state, the chief producers operating in Los Angeles, Garden Cove and Santa Monica. Their output varies from a few hundred pounds to one or two tons per year, but that of the largest manufacturer annually reaches the neighborhood of nine tons. Eucalyptus Oil is recognized in the U. S. Pharmacopoeia as a valuable drug, and is recommended for the cure or relief of a considerable variety of complaints, notably throat and bronchial troubles."—SELLER'S *"Eucalyptus,"* p. 37.

What Experienced Manufacturers Say.

Have Found a Practical Method of Seasoning:—"We have found a practical method whereby we can dry Eucalyptus about the same as plain oak, and when dry, use it for manufacturing all kinds of cabinet work. We saw the logs up to about 3-inch or 4-inch planks, and place them in water for four or five days, gradually letting the water get hot and gradually letting the same water cool; then we pile the lumber to air-dry for several months, and before we use it for cabinet work we kiln dry it. . . . The wood is very hard and takes a high polish. When the lumber is thoroughly dry we do not have any trouble with warping or cracking, and we see no reason why it should not take its place in the commercial world as one of the most beautiful cabinet woods. During the last four of five years we have used this wood for the manufacture of bank and office fixtures, furniture, interior house finishing, decoration work, flooring and for various other uses where a high polish is needed, and also find it very satisfactory for construction and wagon work."—*Hughes Manufacturing and Lumber Company*, J. A. SOUTER, Sup't. Los Angeles, Cal., March 26, 1910.

(Other manufacturers whom we quote, and still others not here quoted, are clear in stating their successful methods in seasoning. For brevity, we omit further details, but the author will be pleased to furnish them to enquirers).

Manufacturing Nine Different Species:—"We are manufacturing all kinds of finished samples of nine different species. We have done this for several years. We have made tables, chairs, checkerboards, canes, flooring, wagon material, etc. . . . For wagon material in my estimation, the eucalyptus has no superior, if equal, for strength and durability. . . . There is no question in my mind but what eucalyptus will take the place of any other hardwood to a very large extent."—*California Souvenir Company*.

A. H. SCHWAN, Manager.

Los Angeles, March 27, 1910.

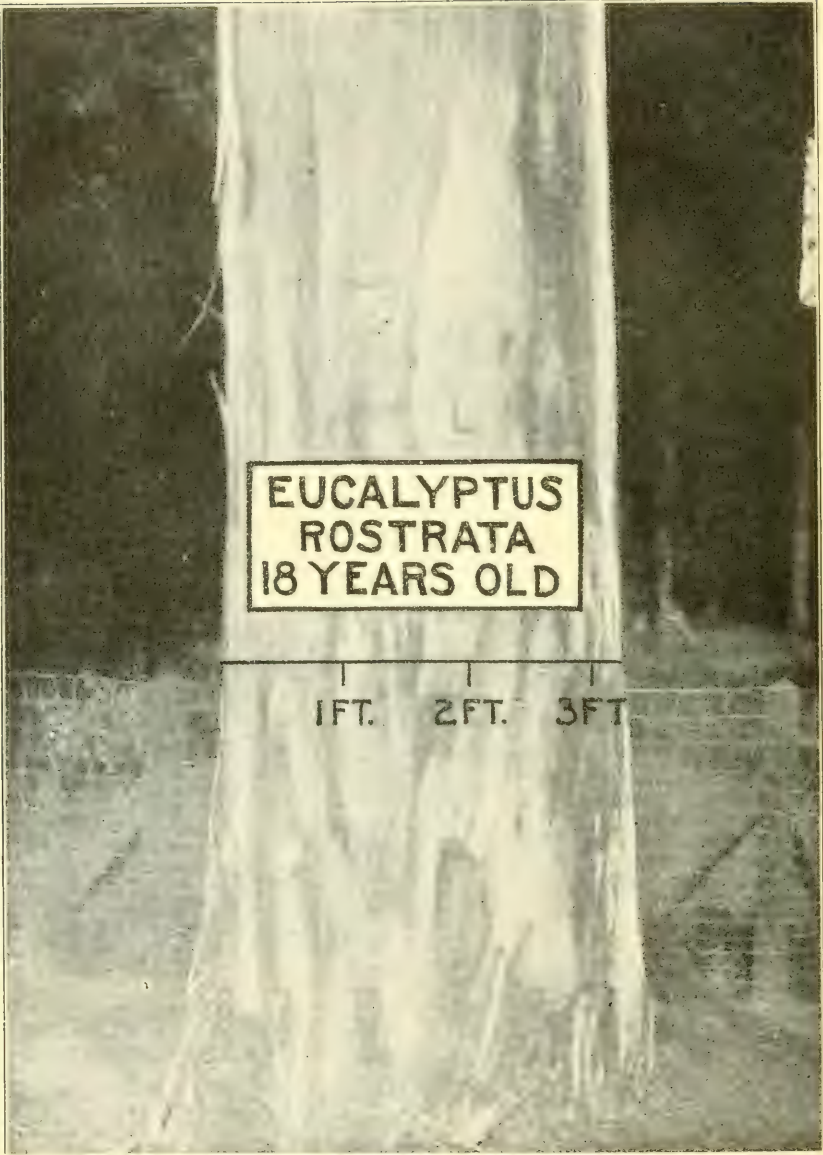
Worked Eucalyptus for 20 Years:—"We have been handling Eucalyptus for 20 years or more, and for 15 years we have worked with it almost exclusively. We are using it for all kinds of wagon work, such as poles, reaches, felloes, bolster, double trees, single trees, neck yokes; also for plow beams, harrows, pruning shear handles, insulator pins and anything that any other hardwood is used for."—*Hardwood Planing Mill Company*,

P. T. PORTER, Foreman.

San Jose, Cal., March 28, 1910.

Market for Eucalyptus Products Is Unlimited—In an address before the Forestry Society of California, A. C. RUMBLE, President of the large furniture factory at San Jose, Cal., said:

"We began manufacturing furniture, tool handles, farm implements from eucalyptus two years ago. . . . As we put out furniture for the richest homes, or store fixtures, it created a demand which we have not yet been able to catch up with. At the present time



A black and white photograph of a tree trunk, identified as Eucalyptus rostrata, 18 years old. The trunk is light-colored and shows vertical bark texture. A rectangular label is affixed to the trunk, containing the text 'EUCALYPTUS ROSTRATA' and '18 YEARS OLD'. Below the label, a horizontal scale is visible, with markings for 1 FT., 2 FT., and 3 FT. The background is dark and out of focus.

**EUCALYPTUS
ROSTRATA
18 YEARS OLD**

1 FT. 2 FT. 3 FT.

we are buying cured Eucalyptus lumber, from Gillespie mill, for \$100 per 1,000 feet. The market for the products of the Eucalyptus tree is unlimited in this state. Such houses as WHITE BROTHERS, San Francisco, and others want large quantities of our supplies, but cannot be accommodated. We have found an unusually heavy demand for the timber worked up into plow beams and other farming implements, but we take nearly double the profits by manufacturing the limited supplies we can obtain into furniture and articles of rich value. The smaller stuff we use up in tool handles and the results of my two years' work in this wood may be summed up briefly that in its various varieties Eucalyptus timber is as strong as hickory, as durable under ground as cedar or locust and as handsome for furniture as Circassian walnut, oak or mahogany. We have been unable to fill an order for 50,000 plow beams for the OLIVER CHILLED PLOW WORKS because we use only a portion of our left-over stock in our implement department, the average fine-grained specimens going entirely into our cabinet work. We are preparing ahead with a supply of lumber and have paid as high as \$30 stumpage on 400 trees located near mill facilities."

The Government Has Educated the People.

Rapidity and Profits:—"The government has given out its findings through official bulletins, and it is well that the education of the people has been undertaken in this way, for the statements of the rapidity with which the Eucalyptus matures and the profits awaiting the grower are so surprising that they might not be accepted as truthful without the government's stamp."—*San Francisco Call*, Feb. 13, 1909.

The Wage Earner's Opportunity.

J. W. ABBOTT, formerly with the United States Department of Agriculture, says:—"I have been aware for some time that there was no way in which a man could provide for his family so effectually as to start a Eucalyptus investment. It is the most wonderful dead-open-and-shut method of provision ever devised. A man does not have to die to beat it. A little money, within the means of a man on salary, will not only fix his children in case of his death, but will make him independent in the course of a few years."

Importance of Eucalyptus to the United States.

... "At the present time there are six manufacturing plants in California sawing and manufacturing Eucalyptus. All of them have difficulty in obtaining logs in sufficient quantity. The prices paid, at the present time, average \$25 per thousand on the stump. There is a good margin of profit for the lumberman between \$25 and \$75 per thousand. Desirable Eucalyptus lumber cannot be imported at a less cost than \$70 per thousand. The HUGHES MANUFACTURING AND LUMBER COMPANY of Los Angeles state that it is impossible to cure the lumber fast enough to fill their orders."—*Out West Magazine*.

Municipally Planted Forests.

The following statements are quoted from an article on "Wealth in Wood," by ROBERT SHACKLETON in the *Saturday Evening Post*.

"It is not only interesting, but really extraordinary, knowing how little we make of the forests of our own country, to find towns in Germany that meet their taxes out of the income of their forests and actually have money left over. 'We treat our forests,' as a German official expressed it to me, 'as national wealth, of which we permit ourselves to use only the interest.' In Germany twenty-six per cent of the land is forest land. To conserve a forest means, properly, to hold it as an income-giving capital. Take the town of Forbach. It is wealthy; for the people own great forest stretches as a community and as individuals own other forests as well. Or, take certain villages in Germany in which community forests pay the taxes and give each citizen forty or fifty marks a year in addition, besides his firewood. In Germany, forests are cultivated just as carefully as farms.

"England, with the national trait that forbids her to see her own faults till the sight is actually forced upon her, has blindly continued tree destruction, and has also continued to put off the time of reforestation. . . . In the British isles barely four per cent of the land is forest land." (In the United States, about 25 per cent.)



MAJESTIC EUCALYPTUS TREES IN CALIFORNIA

"Eighteen per cent of the area of France is forest land; and the French policy is very liberal. At the present time France is planning such an extension of her forestry system as will take two centuries to complete."

The San Diego City Forester's Statement.—In San Diego the city will have 250 acres in all of Eucalyptus set out this spring for municipal profit. MAX V. WATSON, the "Pueblo Forester" of San Diego, is quoted by the *San Diego Union* of Nov. 13, 1910, in an extended article, as saying: "The Eucalyptus is the *one* tree that will produce hardwood of commercial value in a space of time short enough to meet the coming crisis."

The *Western Empire* states that the 50 acres planted in April, 1911, by the city of San Diego, were from 5 to 8 feet high in the following December. It also quotes Forester WATSON as saying:

"The growth that the tree will make is one-third more than in Australia under similar conditions."

Other Varieties.

While the great preponderance of available testimony on Eucalyptus refers to Blue Gum, yet there is considerable attention being paid to two other varieties—Rostrata and Tereticornis.

Business Views by Business Men.

The Santa Fe Railroad is probably the "pioneer" in the commercial planting of Eucalyptus trees on the largest basis ever undertaken. The vast sums being expended in their operations are the result of more than two years of exhaustive investigation.

PRESIDENT RIPLEY, of the Santa Fe R. R., says:

"In my opinion there is no safer investment than the planting of Eucalyptus in territory to which it is adapted, as proven by the experience of the last half century. . . . This Company has already demonstrated its belief in Eucalyptus in the fact that it has already planted 1,500 acres, and proposes to plant 4,500 more."

Santa Fe Forestry Chief REIMERS says: "There is a future in the planting of Eucalyptus for the men who go into it now. I know of no better investment in an agricultural line than this. I believe that the uses to which the timber of these remarkable trees can be put in house-building, railway ties, piles, implements, plow beams, wagon material, fence posts, furniture, telegraph and telephone poles, will secure for this wood an unlimited market in the United States, as soon as Eucalyptus can be (and will be) produced in marketable quantities. With the hardwood famine which America is facing there can be no doubt as to enormously profitable foresting of Eucalyptus in California, which is practically the only State in the Union where the tree will grow."

Eucalyptus Compared with Orchards.—"Eucalyptus planting commercially has a number of points in its favor over the fruit industry, principally because the fruit business is more or less of an uncertainty, while the timber proposition is comparatively sure. A heavy rain during the blooming period of the fruit checks fertilization, a small crop being the result; this is not the case with the wood crop, where the more rain the greater growth and profit. The harvesting period of most fruits extends over but a few weeks, and if it is not gathered at that time the crop is a total loss; while on the other hand the harvesting period of the timber trees extends over a lifetime. The price of labor may be high, or the value of wood much lower than usual; if either is the case the trees may be allowed to stand. The following year they will be larger and more valuable."—Coll. of Agr., Univ. of Cal. Bull. 196; p. 35.

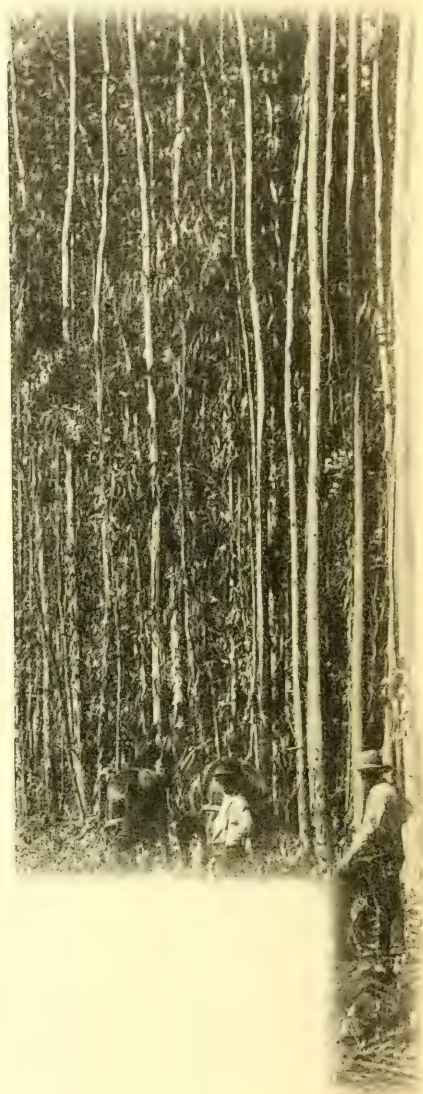
One of the largest banking houses in the world dealing exclusively in timber securities says:

"Why Timber Values Must Increase. Climatic conditions of this and other civilized countries necessitate that we be housed to protect life and health. No matter how depressed business conditions may be, there exists always, therefore, a large and certain consumption of building materials, particularly lumber. It is not difficult to appreciate the source of this demand when one stops to figure that the United States is increasing at

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Eucalyptus in California, originally
planted as a wind-break.



Fuel wood grove—planted very close.

the rate of a town a day—over 4,500 daily—it is as necessary that lumber be manufactured as that crops be grown. If the source of timber were hidden like coal, gold, silver, etc., timber values would be largely speculative and would be an unstable basis of security for loans. But every acre of timber in this country is known and mapped out and the supply is practically measured, and the present annual demand exceeds the annual supply by over 300 per cent. As a result of this condition, there is probably no type of property in existence more stable in value than timber lands or against which bonds can be more safely issued. During the past nine years we have loaned over \$50,000,000 in the form of 6% first mortgage bonds secured by *timber lands*. There has not been a single instance of loss or default of interest or principal in any of these loans, and they have all without exception greatly increased in security.—CLARK L. POOLE & Co., Chicago.

California Business Men Take a Strong Interest—One hundred of the leading Bankers, Officials, Business and Professional Men of a district in Southern California, voice what seems to be the general opinion concerning a 1,000-acre commercially planted Eucalyptus grove in their district, as follows:

"Eucalyptus planting in California is recognized by the highest authorities as a safe, conservative and extremely profitable enterprise. Some of our largest institutions, railroads, banks, capitalists and hardwood manufacturers are planting for investment and for the purpose of assuring a continuous supply of hardwood for their future needs, and judging by the manner in which you have carried out your operations to date, we feel thoroughly confident in commending you."

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